

Macdonald College Library APR 2 1970

from the egg to the chick



The Library,
Macdonald College 800,
P.Q.
MJ-3



THE MACDONALD LASSIE

Macdonald Journal
Volume 31, Number 4
April, 1970

Editor: Mark W. Waldron, Ph.D.
Macdonald Reports:
Gordon Thomson
Associate Editor: Tom Pickup
Family Farm, Office of Information,
Quebec Dept. of Agriculture
and Colonization
Art Director: Jacques E. Charette
Advertising Manager: Hib Saunders
Production-Circulation:
Dorothy Parsons

The Macdonald Journal is published
every month by Ronald J. Cooke
Ltd, 451 Beaconsfield Boulevard,
Beaconsfield, Quebec, 514 697-2916.

Texts in this issue may be reprinted
editorially without permission;
permission should be obtained to
reproduce illustrations. Address
The Editor, Macdonald College,
Quebec. Second class mail registra-
tion number 0463.
Subscription rates are \$7.00 for
two years, \$9.00 for three years
in Canada, U.S.A., and foreign
rates are \$10.00 for two years.
Printed in Canada

In This Issue

End of an Era	70
From the Egg to the Chick	71
The Feeding Value of Propionic Acid-Treated High Moisture Corn	75
The Family Farm	78
This Month with the Q.W.I.	82
The Last Word	85

Editor's Note

Those of us who spend our waking
hours earning our daily bread from
nine to five with the occasional
overtime try to do our best in our
chosen profession for ourselves
and for those dependent upon us.
We think we give it our all. But
then we look at a group of volun-
teers who have heeded the
admonition to "cast thy bread upon
the waters" and admit that we
have to pause and wonder if
it is our all.

These thoughts were brought to
mind the other day when the
Q.W.I.'s Secretary, Mrs. Burgess,
brought us in the latest material for
the Journal and explained the
changes they are attempting in
presenting their news. Reading
through their material and realizing
that because they want to, and
not because they have to, they

tackle everything from Bill 62 to
seeing that a shut-in is remem-
bered; from making a quilt to raising
money for school lunches; from
helping a neighbour whose belong-
ings have been lost by fire to
helping a Northern Branch whose
members they have never met, we
believe that the volunteer work
that they do is returned to them
tenfold both in the pleasure of do-
ing and in a job well done.

Editorial

The end of an era has come for farmers in Western Canada. As we watch history unfold, we see the opposite of what took place some 80 years ago. At that time, farmers were literally paid to move to Western Canada where the pioneering spirit could be supplemented with free land and lots of it. The recent move of the Federal Government to pay Prairie farmers not to grow wheat will now result in a depopulation of the Western plains. So much can change in less than a century!

In looking at the many aspects of the situation, the acreage payment was the only thing that could be done. In fact, the move should have been made two years ago when it was obvious that the Prairie grain economy was headed down a one way cul-de-sac. The financial outlay by the Federal Government, while startling urban taxpayers, is justified on the basis that it was the Federal Government who not too long ago was telling Prairie farmers to grow wheat and the government would sell it.

This end of an era means that Canada will never return to a major wheat exporting country. Many of our best customers have moved from an import basis to an export basis during the past five years. The traditional British wheat trade is threatened with the protective policies of the European Economic Community. There have also been changes in milling practices whereby countries that once depended on high quality Canadian wheat now can use lower quality, locally-produced wheats that result in an acceptable product for the consumer.

There are also those who wonder why, when Canada has such a sur-

plus of wheat, it should not be made available to the less fortunate people of the world. But it is a fact that starving people cannot buy wheat with dollars they don't have and probably cannot get. Furthermore, they probably prefer rice, meat, and vegetables.

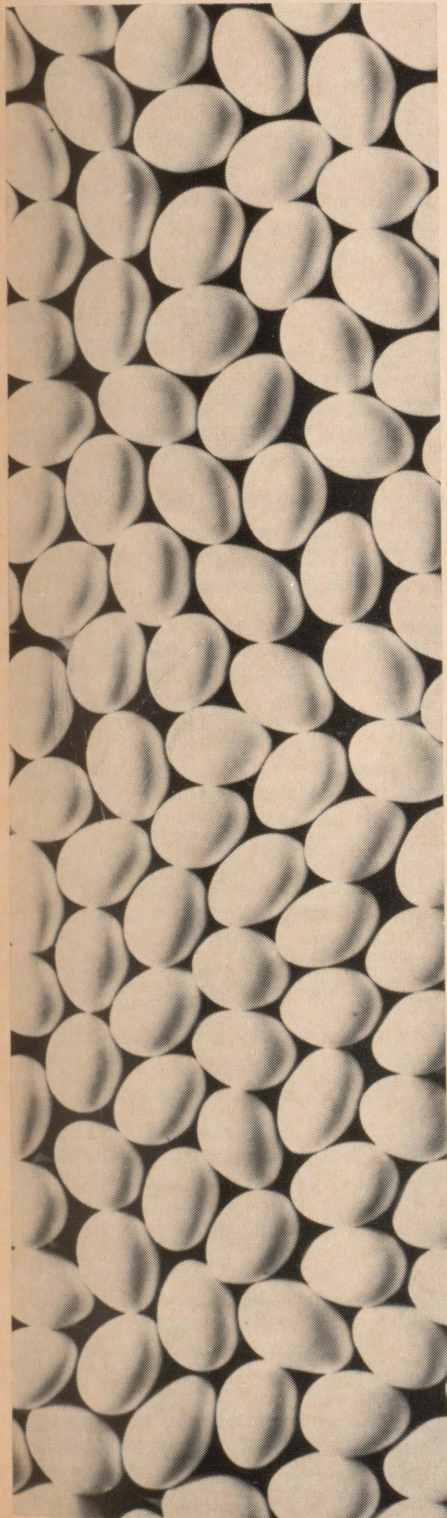
With the acreage payments to Prairie farmers there is an incentive to retire land from wheat production and return it to forage. For those who stay on the land, this recent financial input will likely be spent on converting to beef units, producing a commodity which is in demand in Canada. Some may grow barley which can be fed to hogs but one million acres of Saskatchewan, which really isn't very much, could produce enough barley for enough hogs to guarantee every Canadian man, woman, and child an additional 15 pounds of pork per year. So any mass conversion to hogs could lead to surplus problems comparable to wheat.

For the Prairie farmers who are not able to adjust to this end of an era, the only future is to take the money, try to sell their land and move over the Rockies to sunny Kelowna or Vancouver. Many, we suspect, will do just that.

So an end to the pioneer era has come. And while we get emotional about the rapidity of change, we must congratulate a Prime Minister who only a year ago was so badly advised and who obviously did not know the trade practices of the Canadian Wheat Board. Finally he has seen the light and done something constructive about it. It is the end of an era, in more ways than one.

Mark W. Waldron

from the **EGG** to the chick



The artificial incubation of chicken eggs has been done by man for hundreds of years. The ancient Egyptians hatched eggs on long shelves in large "walk-in" ovens, the Chinese used to pack eggs in rotting manure and the heat produced would be sufficient for embryo development.

Most chickens of today are hatched in modern mechanical incubators holding thousands of eggs where heat, humidity and the turning of the eggs are all mechanically controlled. The humble little hen with her brood of chicks is now a rare sight since motherhood is not a virtue prized in the commercial bird.

However, with a small amount of money, a medium amount of luck and lots of patience anyone can produce chicks or watch the progress of the developing embryo either in his own home or at school. A well-explained exhibit on embryology is also a perfect project for science fairs.

The Egg

For a project of this type fertile eggs are needed. These must be purchased from a local hatchery or the agronomer in your area may be able to suggest a source. If you are within driving distance of Macdonald College, fertile eggs may be purchased from the Department of Animal Science. Most eggs sold in grocery stores are infertile, that is, the females have not been allowed to mate with males. There is no way to tell whether an egg is fertile unless it is broken out and examined microscopically. This technique requires a great deal of practice.

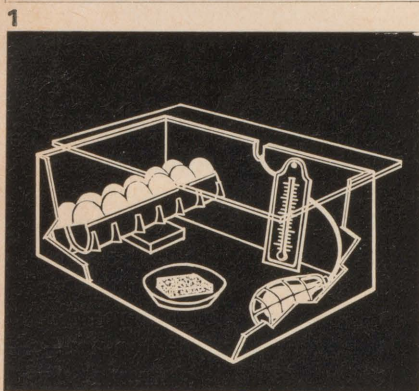
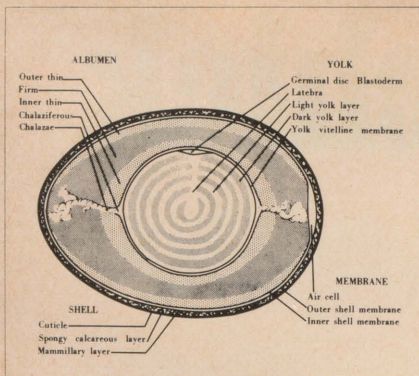
Every egg yolk shows a tiny, white, circular spot called the germinal disc. This is present whether the egg has been fertilized or not. It is this disc, that the male sperm penetrates when it meets the yolk in the upper part of the female reproductive tract. The embryo will then grow from this germinal disc when the egg is incubated. After fertilization takes place, the yolk moves down the tract; the albumen layers are added, the shell membranes and eventually, the shell. The time from fertilization to egg laying is about 25 hours. This means that a hen cannot usually produce more than one egg per day. Some embryonic development takes place during the period of egg formation but this development is not visible to the naked eye.

After the egg is laid it can be stored for up to 10 days before being incubated. However, the sooner it is placed in the incubator the better are its chances of hatching. If it is necessary to store the eggs for a few days a temperature of 50-60°F. is best.

Once the egg is placed in the incubator it will take 21 days to hatch.

The Incubator

The embryo needs only three conditions for growth; a source of heat, humidity, and rotation of the egg. Chicks have been hatched in electric ovens, on heating pads and even in electric frying pans but these are not recommended practices, especially if your mother uses her frying pan fairly frequently. Three types of incubators suitable for home or classroom projects will be described:



2

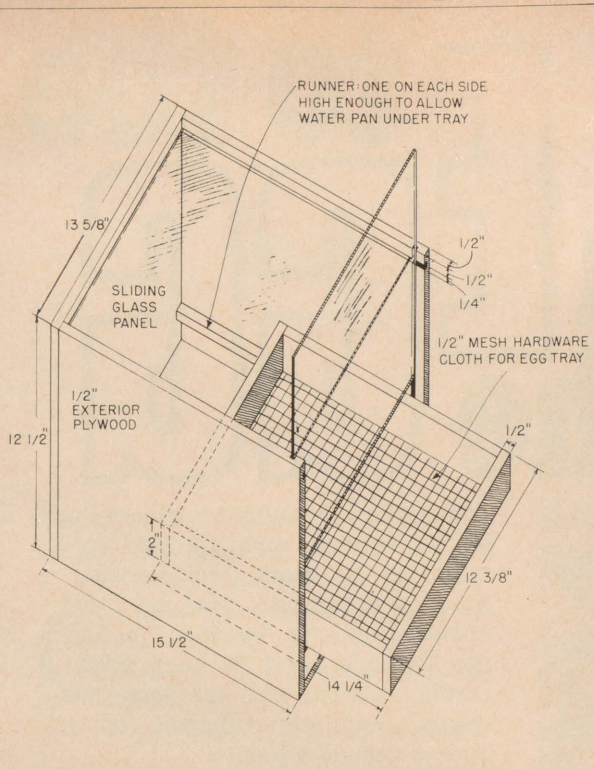
A cardboard box incubator (Figure 2)

1) Use a sturdy box 8" x 12" x 12", cutting off the top flaps. This size will easily accommodate a dozen eggs.

2) Place a light bulb inside the box with a household thermometer close to the eggs and a few inches from the light bulb. Be sure to cover the bulb with a wire cage so that it will not come in contact with the cardboard. You may have to experiment to get the correct wattage of bulb for your conditions. Start with a 40 watt.

3) Cover the box with a sheet of glass and bring the temperature up to between 101-103°F. The temperature should stay within this range through the first 17 days of incubation. On days 18-21 the temperature may be lowered to between 99-101°F. The temperature is regulated by adjusting the top opening with the sheet of glass.

4) Humidity is provided by a small pan of water. Without humidity the embryo and egg contents would become dehydrated. To determine the humidity level a wet-bulb thermometer can be constructed by putting a small piece of heavy cloth around the bulb of an ordinary thermometer and placing the other end of this cloth wick in the pan of water. Allow at least two inches of wick between the thermometer bulb and the water. The humidity level should read about 85°F. on the thermometer. If humidity is too high use a smaller dish. If too low, place a small piece of sponge in the dish to increase surface area for evaporation.



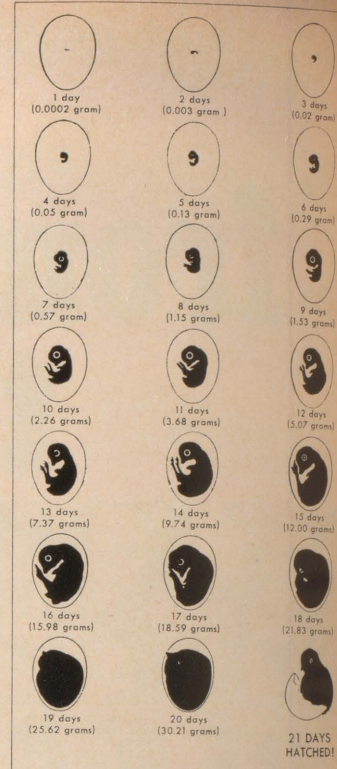
3

5) The eggs should be turned at least three times daily. This is easily accomplished by placing a two-inch block under the side of a commercial egg carton to elevate it. If possible, the opposite side of the carton should be elevated about every four hours but this schedule is often difficult. Good results can be obtained by shifting the eggs first thing in the morning, again at noon and again in the evening before bedtime. Turn the box end-for-end each time the carton is tipped in order to compensate for temperature variations within the box. On the 18th day remove the eggs from the box and place them on their side on the floor of the box. It is not necessary to turn them after the eighteenth day.

6) If the incubator does not heat to 101°F., you can place it inside a larger box and put an insulating layer of crumpled newspaper between the two.

A home-made incubator with automatic temperature regulator (Figure 3)

1) Materials needed: Waterproof plywood (1/2"), less than 1/4 sheet, 2 sides 15 1/2" x 12 1/2"; 1 back 13 5/8" x 12 1/2"; 1 bottom 12 3/8" x 15"; Board (1/2" x 2"), about 5 running feet, 2 sides for tray 13 1/2" x 2"; 2 ends for tray 12 3/8" x 2"; Tray Runners (2), 1/2" x 14 1/4"; Glass (Double diamond), 1 piece — 12" x 13 5/8" front; 1 piece — 13 1/8" x 15 1/4" top; Hardware cloth — 1 piece — 14 1/4" x 12 3/8"; Heating unit: purchase from Lyon Rural Electric Co., San Diego 12, Calif. Midget incubator kit, Cat. No. A480, (under \$10); Thermometers, 1 wet bulb, 1 dry bulb: special incubator thermometers can be purchased from the above company; Humidity tray: 10" x 14"; Misc: brads, screws, nails, tape.



4

2) The temperature should be between 101-103°F. and can be adjusted by using the thermostat supplied with the heating unit. Follow the manufacturer's instructions. A constant temperature is very important.

3) Humidity and egg turning are explained in the previous sections 4 and 5. This machine will easily hold two dozen eggs.

4) Three or four small (1/2" diameter) ventilation holes should be made in the back panel of the incubator.

A small commercial incubator

For continued classroom use or for the back-yard fancier who does not want to go to the trouble of constructing an incubator, the commercial model is recommended. These can be purchased for egg numbers of 12 up to 100 and are fairly dependable. See the list of manufacturers at the end of this article and follow the instructions received with the machine. The small plastic two-egg incubators seen in popular magazines are not recommended as the chances of success with only two eggs are not very good.

Location and testing of the incubator
Locate your incubator in a room where the temperature is between 70-75°F. Do not place it near a radiator or where the sun can shine directly on it. This may cause overheating and death of the embryos. Do not place the incubator where it will be continually in a draft nor where it will be jarred frequently. Have the machine working correctly for at least two days before the eggs are placed in it. Once the eggs are in, open the incubator only to turn the eggs or to add water to the humidity pan. Do not open the incubator after the 18th day unless water is needed. Always add warm water to the humidity pan.

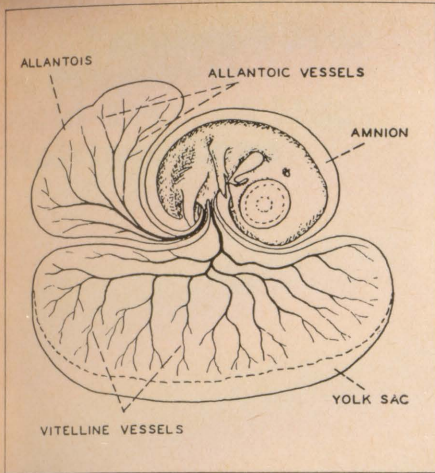


Figure 1. The structure of an egg (from Eggs, Publication 782, Canada Department of Agriculture, 1967.)

Figure 2. A cardboard-box incubator (from Massachusetts 4-H Leaflet 130, 1963.)

Figure 3. The home-made automatic incubator.

Figure 4. Changes in the size and form of the developing embryo.

Figure 5. Seven-day old embryo.

The Embryo

When incubation conditions are correct the embryo develops very quickly (Figure 4). What was once an uninteresting mass of yolk and albumen soon becomes a wiggling embryo producing some rather complicated membrane structures to provide himself with food and oxygen while in the shell.

At about 24 hours of incubation, a membrane called the amnion gradually develops and surrounds the growing embryo. This membrane will be filled with a clear fluid (amniotic fluid) which protects the embryo from sudden temperature changes and jarring. Also during the first 24 hours the yolk sac starts to form. This membrane will eventually cover the entire yolk surface and the blood vessels running through it will bring yolk material to the embryo for growth. Another membrane, the allantois develops at about 36 hours and grows until it completely lines the egg by nine days. The blood vessels of this membrane act to carry oxygen to the developing embryo and remove carbon dioxide. The egg-shell has tiny pores in it through which this exchange of gases takes place. The blood supply of the allantois also brings nutrients to the embryo from the albumen and calcium from the shell for bone growth. Figure 5 shows a seven-day embryo plus the embryonic membranes.

A study of the sequence of events in the development of the embryo can be of considerable interest. Some of the more important stages when eggs might be opened for study are given as follows: Second day (about 30 hours): Blood formation and heart beats can be

observed. Sixth day: Main divisions of the legs and wings can be observed. The body which has been very small in proportion to the head now begins to develop rapidly. Eighth day: Feather follicles appear in definite tracts. Tenth day: The beak begins to harden and the embryo becomes quite bird-like. Thirteenth day: Down appears on the body, scales and nails appear on legs and feet. Seventeenth day: Beak turns toward air cell; scales, claws and beak are becoming firm and horny. Nineteenth day: Yolk sac starts to enter body cavity through the umbilicus or navel; the beak punctures the air cell. Twentieth day: Yolk sac completely drawn into body cavity; the chick pips the shell. Twenty-first day: The chicks break out of the shell. The chick is wet and tired at this time and needs a few hours to get on his feet.

Candling the eggs

At between five and seven days of incubation if the egg is held up to a strong light in a darkened room, embryo development can be easily seen. This process is called "candling". Infertile eggs will be quite clear. If the embryo is developing you will see a net-like pattern of veins and if the egg is rotated and then held still you can usually see the embryo moving about.

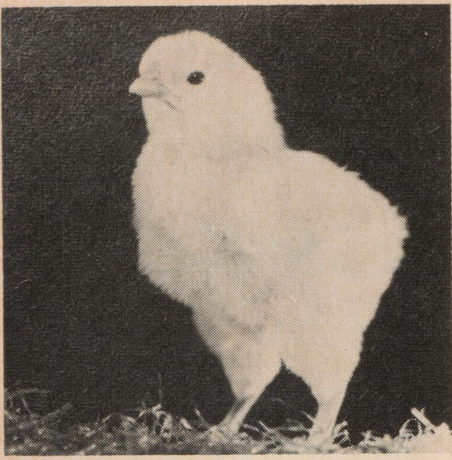
Studying the embryo in the shell

To study the embryo within the shell, select a fertile egg and leave it in the blunt-end-up position in the incubator for about four hours. Remove the egg from the incubator and puncture the shell in the centre of the blunt end with a pair of small shears. With the shears,

cut out a small circle of the shell, the embryo can then be seen floating on top of the yolk. After you have located the embryo, the egg opening may be enlarged, being careful to avoid the embryo and the blood vessels. A magnifying glass or binocular microscope is useful in identifying the various body parts. The embryo can be replaced in the incubator and will live several hours in this condition. The technique of studying embryos in the shell is useful only up to six days. After that time the developing membranes cover the embryo and it should be broken into a small dish for study.

Preserving embryos

If you break open eggs at various stages for study, it is possible to preserve them in order to later display the sequence of development. Break the egg gently into a flat dish. Separate the embryo from all extra-embryonic membranes with blunt tweezers and sever the umbilical cord near the body wall. Wash the embryo very gently and thoroughly in warm tap water to remove all yolk and albumen material. To preserve the embryo place it in a 10 percent formalin solution in a small jar with a screw cap. Small baby food jars are excellent for this purpose. Never leave your formalin solution where young children can reach it and never inhale the fumes yourself. It can cause burns. Label each jar with age of embryo, etc.



The Chick

If you decide to allow your eggs to hatch, be prepared to give the chicks the care they will need. A home-made incubator should hatch about half of the eggs set.

Do not open your incubator until late on the 21st day. The hatching chick needs a high humidity at this time and is also susceptible to chilling. The chick has ample yolk material in its body cavity to sustain it until the 22nd day. Resist the temptation to help chicks out of the shell until the 22nd day of incubation. Small incubator conditions sometimes slow down embryo growth and in helping the chick out too soon you may cause excessive bleeding.

Late on the 21st day and again on the 22nd day remove all well-dried chicks. A large cardboard or wooden box can serve as a home during the brooding period. Use wood shavings or sawdust on the floor of the box and clean the chicks weekly.

For small numbers of chicks use a large light bulb as a heat source. A red or blue bulb is preferable to a white one since it is easier on the chicks' eyes and helps to prevent feather picking. Suspend the bulb above one end of the box and place a wire cage around the bulb so that it cannot come in contact with either the box or the chicks.

The temperature under the bulb should be 90-95°F. for the first week and can be reduced five degrees each week by raising the height of the bulb. After four weeks of age, if the chicks are feathered, the bulb can be completely removed.

Small chick feeders and waterers can be purchased from a farm supply centre but any shallow pan will serve the purpose as long as the dishes are kept clean. Chick feed can be purchased at most feed and grain dealers.

If you want to keep your chicks through the summer, a simple wire frame enclosure will be adequate for outside use. Cover one end to provide shelter from sun and rain. Cover all sides including top and bottom of the pen with small mesh wire to prevent wandering cats from getting in. Chicks six to eight weeks old can be put outside about mid-May unless the weather is especially cold or damp. If the pen has a wire bottom it can be moved over the grass and the chicks will enjoy this green feed. Provide a perch in your pen about six inches from the ground and in planning the size of the pen allow each chick about two square feet.

Good luck and beware of the gleam in your mother's eye as Thanksgiving approaches.

Dr. R. O. Hawes,
Department of Animal Science.

Sources of supplies:

- 1) Small commercial incubators and miscellaneous supplies: a) Can-Lab Supplies, 8655 Delmeade Rd., Town of Mount Royal, Montreal, Quebec. b) Arnold-Nasco Ltd., 58 Dawson Rd., Guelph, Ontario.
- 2) Heater kit for home-made incubators: Lyon Rural Electric Co., San Diego 12, California.
- 3) Formalin solution: a) Can-Lab Supplies (see above).
- 4) Fertile eggs: Department of Animal Science (Poultry Research Unit), tel: 453-6580, local 320, Macdonald College, Quebec.
- 5) Film: Embryonic Development of the Chick, (for high schools). The Film Library, Centre for Continuing Education, Macdonald College, Quebec.
- 6) Film Strips: Embryo development of the chick (with instructor's manual, for intermediate grades), El Corral Bookstore, California State Polytechnic College, San Luis Obispo, California.
- 7) Additional reading: Patten, B. M., 1952. "Embryology of the Chick", (The Blakiston Co., New York, N.Y.). Lillie, F. R., 1952. "The Development of the Chick", (Henry Holt and Co., New York, N.Y.). Romanoff, A. L., 1960. "The Avian Embryo", (The Macmillan Co. of Canada Ltd., St. Martin's House, 70 Bond St., Toronto 2, Ontario.) Card, L. E. and M. C. Necheim, 1966. "Poultry Production" sections on incubation, brooding and management, (The Macmillan Co. of Canada Ltd., St. Martin's House, 70 Bond St., Toronto 2, Ontario.) The Poultry Science Club, The Pennsylvania State University, University Park, Pennsylvania (various bulletins on science projects for high school students).

The Feeding Value of Propionic Acid-Treated High Moisture Corn

Feeding trials recently have been completed by Drs. E. Donefer, J. I. Elliot and myself on the nutritional value of high moisture shelled corn treated with propionic acid (Propcorn). Propcorn is a method developed by BP Oil Ltd. for the preservation of damp grains. Government registration is pending and is dependent upon approval of these results.

Corn was harvested with a picker-sheller in mid-October. Approximately 12 tons of shelled corn were immediately treated with propionic acid at a rate of 30 pounds of acid per ton of corn. This corn was stored on the barn floor until the feeding trials commenced on November 25, 1969. During these studies Propcorn was ground in a hammer mill (weekly). Another 10 tons of shelled corn were stored in a conventional, upright silo (silo corn). The silo was sealed with plastic. Silo corn was removed and ground every Tuesday and Friday of the feeding trial.

Fourteen Holstein heifers, weighing approximately 700 pounds were divided into two equal groups and were fed a ration of corn silage free choice, 1 pound per head daily of a 32 percent protein supplement, and 10 pounds per head daily of either Propcorn or silo corn. In the swine studies, 40 pigs with an average weight of 56 pounds were allotted to four groups of 10 pigs each. Two groups received a ration based on Propcorn and the other two groups were fed a silo corn based ration. A growing-finishing ration was prepared by mixing corn with a 38 percent commercial hog concentrate (70 percent corn, 30 percent concentrate). Feed consumption and weight gains were recorded over an eight-week period for both species.

Thirty-six Holstein cows were allotted to three groups of 12 cows. Cows were grouped on the basis of milk production and milk fat percent. All cows were fed corn silage free choice as the only forage and additional mineral. One group was fed 10 pounds Propcorn while a second group received 10 pounds silo corn per head daily; both groups were fed a 32 percent dairy supplement. The third group received a 24 percent dairy supplement (control). Supplements were fed to meet NRC requirements for milk production. Feedstuffs were analyzed by the Macdonald College Feed Testing Service (Table 1).

Samples of Propcorn and silo corn were obtained at the time of grinding and were analyzed for mould, pH, and lactic acid (Table 2). Visible mould was present in the silo corn upon removal from the silo. There was a slight decline in mould counts of silo corn at three days post-grinding (1000 colonies). Silo corn was higher in lactic acid. These levels were similar to values reported in the literature.

Holstein heifers fed Propcorn gained an average of 1.3 pound per day in comparison to average daily gains of 1.1 pound for heifers receiving silo corn. The difference in gain was partially explained by greater corn silage intakes by Propcorn heifers (36 pounds per day vs. 30 pounds). Total daily dry matter intakes and feed efficiencies for Propcorn and silo corn were: 18.4 and 16.4 pounds dry matter;

15.6 and 16.5 pounds feed per pound gain. The percent increase in average daily gain and feed efficiency was 18.2 and 5.5, respectively. While gains and feed efficiencies were lower than those expected for beef animals on finishing rations, they were in line with those given by NRC for normal growth of beef animals.

Feed consumption, average daily gain and feed conversion of pigs fed Propcorn and silo corn based rations are shown in Table 3. Pigs receiving the Propcorn based ration consumed more feed, gained at a greater rate, and converted feed to gain more efficiently than pigs fed the silo corn based ration. Feed costs per pound of gain were 12.7 and 13.5 cents, respectively.

The most important factor determining whether dairymen will decide to treat high moisture corn with propionic acid is not one of increased milk production. There were no differences in milk yield or composition between the three rations (Table 4). Cows fed silo corn raised their milk fat percent by 0.3. There was no change with either of the other two rations. The intake of propionic acid from the treated corn was estimated at 68 grams per cow per day. Propionic acid is formed by microbial activity during normal metabolism of feedstuffs within the rumen. An increased production of this acid in the rumen has been linked with depressed milk fat percent, as this acid stimulates deposition of body fat by the animal. Although milk fat was not depressed, cows fed Propcorn gained an average of 1 pound of body weight per day.

Table 1. Chemical composition of the ration components for the feedings studies (Dry matter basis).

	Dry matter (%)	Crude protein (%)	Cellulose (%)	Digestible energy (kcal/g.)
Corn silage.....	30.0	8.7	29.3	3.07 ^a
Propcorn.....	66.7	9.6	4.4	3.76
Silo corn.....	65.3	9.8	3.8	3.84
24% Dairy supplement.....	—	27.0	7.1	3.71
32% Dairy supplement.....	—	33.7	13.2	3.10
Pig ration.....	72.3	15.5	—	—

^aDigestible energy estimated on the basis of dry matter level of the corn silage.

Table 2. Analysis of Propcorn and silo corn for mould formation, pH and short-chain fatty acids^a.

	Propcorn	Silo corn
Mould counts (colonies/g.).....	0	1,200
Lactic acid.....	0.55	1.18
pH.....	4.26	4.64

^a% of total dry matter.

Table 3. Feed consumption, average daily gain and feed conversion of pigs fed rations based on silo corn and Propcorn.

Ration	ADG (lb)	Change (%)	ADF (lb)	Change (%)	As fed		D.M. basis	
					F.C. (lb)	Change (%)	F.C. (lb)	Change (%)
Propcorn.....	1.54**	+ 10.8	5.95	+ 4.8	3.53	+ 5.1	2.56	+ 4.5
Silo corn.....	1.39		5.68		3.72		2.68	

**Means were significantly different at $P < .01$.

However, the same response was observed for the control cows and they received neither propionic acid nor high moisture corn. In comparison the estimated intake of propionic acid supplied in corn silage was 45 grams per cow per day. Weight gains may have been a reflection of total energy intake in combination with efficiency of milk production (Table 5). Energy intake per pound milk produced was slightly greater for silo corn-fed cows. However, total energy intake was lowest with Propcorn. It was noted that all cows were fed protein supplement in excess of requirements during the first four weeks. It was during this period of time that greatest gains in body weight occurred. It would appear that energy from silo corn was not used as efficiently as from Propcorn or the control ration and that Propcorn was more efficient than the control ration. The presence of mould in silo corn may have been partially responsible. Corn silage intakes ranged from 1.90 pound dry matter per 100 pounds body weight (silo corn) to 2.16 (control). Silage intake by Propcorn cows was intermediate at 1.95 pound. The amount of energy supplied by corn silage varied from 63 to 66 percent. One reason for the maintenance of milk fat percent was that crude fibre intakes, as a percent of total dry matter intake, were 22 percent. An intake of 16 percent is considered as minimal for optimal milk production. Milk production from cows fed Propcorn were as consistent as that of the control group and were less variable than when silo corn was fed.

The greatest advantage of Propcorn was a combination of return over feed cost and reduction in labour. Although milk receipts were slightly less with Propcorn, return over feed cost favoured its inclusion as a part of the ration (Table 6). Feed costs per hundredweight were estimated at: corn silage, \$0.38; Propcorn, \$2.48; silo corn, \$2.55; 24 percent dairy supplement, \$4.75; and 32 percent dairy supplement, \$5. The cost of propionic acid was \$2.05 per gallon (9.98 pounds). During this study the value of 4 percent milk produced on the Macdonald College Farm was \$6. Reduced handling of Propcorn favoured this method over ensiling. After preservation, propionic acid-treated corn was handled one day per week. To prevent spoilage in conventional silos, high moisture ensiled corn should be removed from the silo at a rate of two inches per day. This increases the labour requirement. To do this with a 20-foot diameter silo, as used in this experiment, 2,500 pounds of silo corn must be fed per day. At 10 pounds per cow daily, this represents 250 cows.

The results from this study indicate that propionic acid is as effective for the preservation of high moisture corn as ensiling. No adverse effect on animal health or production was observed. Daily gains were improved significantly by the inclusion of propionic acid-treated corn in the ration of growing pigs. A partial explanation for this response could be attributed to increased feed intake and greater efficiency of utilization of feed. A similar trend was observed with growing Holstein heifers. Milk production from propionic acid-treated corn equalled that of ensiled corn or a commercial concentrate mixture. Cost of production was greater with the commercial mixture. Studies at Cornell University have shown that high moisture corn, ensiled in a Harvestore, maintained milk production at the same

Table 4. Milk production, composition, and change in body weight during the lactation study.

Ration	Milk production per cow			Milk composition		Body weight change (lb.)
	Total (lb.)	4% FCM (lb.)	FCM (lb./day)	Fat (%)	Protein (%)	
Propcorn.....	2118	2099	38.2	3.9	3.5	+56
Silo corn.....	2099	2169	39.4	4.2	3.4	+25
Control.....	2126	2151	39.1	4.1	3.4	+49

Table 5. Average daily nutrient intake per day and efficiency of nutrient utilization for milk production.

Ration	Nutrient intake			
	Digestible energy (Mcal/day)	Crude protein (lb./day)	Dry matter (lb./100 lb. body wt.)	Digestible energy intake (Mcal/lb. FCM)
Propcorn.....	58.4	5.14	2.89	1.54
Silo corn.....	59.1	5.43	2.86	1.62
Control.....	61.8	5.88	3.30	1.54

Table 6. Milk receipts, feed cost and return over feed cost during the 55-day lactation period.

Ration	Milk receipts (\$)	Feed cost (\$)	Return over feed cost	
			(\$ per cow)	(\$ per 100 lb. milk)
Propcorn.....	126.25	51.76	74.49	3.53
Silo corn.....	128.61	54.73	73.89	3.51
Control.....	127.56	56.02	71.53	3.37

level as cows fed dry corn. Both corn based rations were superior to a dairy concentrate. However, there was a significant depression in milk fat percent. Cows receiving high moisture ensiled corn consumed less forage and, hence, crude fibre intake was only 13 percent of the total dry matter intake. Researchers at Pennsylvania State University have suggested that a 16 percent level of crude fibre intake is desirable for maintenance of milk fat percent. As pointed out previously, fibre intakes in the Macdonald College studies were 22 percent, a reflection of the high corn silage intakes.

Return over feed costs favoured the inclusion of propionic acid-treated corn in the ration of dairy cattle and swine. Advantages of treating high moisture corn with propionic acid in comparison to ensiling are: (1) Propcorn requires no special storage equipment. It can be stored on the barn floor or in a bin; (2) Propcorn can be ground for feeding at the dairyman's convenience. Ensiled corn should

be removed from the silo every day and at a rate which maintains quality and prevents spoilage (not less than 50 cows or 125 pigs); and (3) Propcorn can be transferred over long distances, ensiled corn cannot. Both methods of preservation must be handled as soon as harvested. In addition propionic acid-treated corn must be stored in a place where it will not be exposed to rain. It also is restricted to use as an animal feed.

The Macdonald College studies indicate that high moisture corn treated with propionic acid is a palatable and economical feedstuff which can be handled more conveniently with less labour than shelled corn preserved in a silo.

Dr. G. M. Jones,
Department of Animal Science.

The Family

Farm

Published in the interests
of the farmers of the province
by the Quebec Department of
Agriculture and Colonization

Construction of New Intermediate Watercourses and Line Ditches

Professional farmers in the counties of Abitibi and Témiscamingue who wish to construct intermediate watercourses or line ditches may obtain assistance from the Department of Agriculture and Colonization.

The Department provides this assistance by supplying free of charge the technical help needed to prepare the plans for intermediate watercourses and line ditches and making a financial contribution to the construction.

This assistance policy is administered by the Agricultural Hydraulics division in collaboration with county agronomes.

Farmers wishing to take advantage of this assistance policy should apply to their county agronomer who will supply them with the necessary application form (D-1-190) and explain the procedure to be followed.

The agronomer must study the farmer's application, make sure that it meets the requirements of the assistance policy, and prepare his report using form D-1-191 stating the real object of the application, the potential financial benefits of the project and its importance in the local agricultural context, and submit two copies of the application and of his report to the Agricultural Hydraulics division.

On receiving the application, the Agricultural Hydraulics division will proceed to inspect the site and,

in collaboration with the farmer, prepare a plan for the construction of the intermediate watercourse or line ditch.

The Agricultural Hydraulics division will, in due course, send the completed plan to the farmer with details of the financial assistance which the Department may grant to carry it out.

Technical assistance provided consists in inspection of the site to verify the object of the application, a study of the topography of the terrain, and the surveying and level-taking required to determine the size, depth, and fall of a ditch which will ensure adequate drainage. This assistance is entirely free.

The Department undertakes to carry out, with its own equipment, the work of digging and spreading, and also such removal of trees as may be necessary to do the work. All other works involved, such as fencing and bridging, are at the owner's or user's expense.

Any professional farmer wishing to construct an intermediate watercourse or line ditch in the counties of Abitibi and Témiscamingue in accordance with plans prepared or approved beforehand by the Agricultural Hydraulics division of the Department of Agriculture and Colonization may benefit from this plan.

Applicants must: 1. Submit an official application for assistance, duly approved by the county agronomer; 2. Farm a lot situated on an improved or adequately emptied watercourse system in the Northwest Quebec region.

The Quebec Agricultural Marketing Act

Speaking to agricultural representatives and technicians of the Department of Agriculture and Colonization's St-Maurice regional office at a meeting in St-Louis-de-France near Trois-Rivières, Mr. Gilles Prigent, director of the Quebec Agricultural Marketing Board, said that Quebec's Agricultural Marketing Act had become one of the essential tools made available to farmers at the Department's instigation to promote orderly and efficient marketing of their products while taking into account the needs of consumers and middlemen.

The meeting was the third in a series designed to familiarize staffs of the agricultural department's 12 regional offices with the marketing board and enable them to inform the farmers in turn.

The program covers technical and practical aspects of the Board and its powers. The meetings — which are always followed by a long discussion period — deal mainly with the Act and associated legislation and recent amendments to it, joint marketing plans, producers' boards and syndicates, Board orders, surety-bonds, and consolidation of dairy plants.

The directors of the Board have already met regional agricultural staffs of Northwest Quebec, St-Hyacinthe and Trois-Rivières. They will continue their tour in the other regions in the fall, following a schedule to be drawn up later.

a promising looking lot of young hogs
belonging to Mr. Léo Côté
of Sainte-Edwidge in Compton County.



The Quebec Agricultural Marketing Board, formed to replace the marketing bureau in 1963 when the Act which it administers was revised, has helped to give farmers additional means of marketing their products rationally and efficiently. It is a government body with virtually judicial powers and is responsible for approving or rejecting joint marketing plans; arbitrating, deciding, adjusting or otherwise settling disputes arising from such plans; and establishing negotiating agencies to facilitate agreements between producers and buyers. It also has other powers — in particular regarding registration of producers and buyers, and the issuing, suspension, and cancellation of licences to persons engaged in the marketing of farm products.

In cooperation with the agricultural department's marketing branch, the Board may also conduct inquiries concerning costs of producing, transporting, processing and distributing farm products and any other aspect of their marketing.

Under the Dairy Products and Dairy Products Substitutes Act, the Board also supervises the marketing of fluid milk and issues permits to operate dairy processing plants and dairy substitutes factories.

The Board has seven members, including a president and vice-president, and has its head office in Montreal. It also has an office at Quebec.

Payment of \$3 Premium on Slaughtered Hogs to Continue

The Minister of Agriculture and Colonization, Mr. Clément Vincent, has announced that no change will be made in the present provincial regulations relating to the payment of a premium for slaughtered hogs. Mr. Vincent said that hog raisers meeting the requirements of the act to improve the quality of hogs on the farm will continue to get the \$3 premium granted by the Quebec Department of Agriculture.

Mr. Vincent's statement follows an announcement of a change in policy regarding payment of the federal premium. Starting last January the Canada Department of Agriculture is granting a premium of only \$1.50 instead of \$3 on hogs with an index of 105 or over in the carcass grading system introduced on December 30, 1968.

Maintenance of the Quebec premium at the \$3 level is designed to continue to encourage hog raisers to improve the quality of their stock. Beneficiaries must be genuine farmers and the slaughtered hogs must satisfy the conditions of the Canada Agricultural Products Standards Act.

Two ROP Trials for Young Beef Bulls at St-Hyacinthe

The Minister of Agriculture and Colonization, Mr. Clément Vincent, has announced two ROP trials for young beef bulls at the St-Hyacinthe station in 1970, one in the spring and the other in the fall. The tests will provide beef breeders with a report on the rate of gain of their future herd sires in comparison with bulls of the same and other breeds.

Final date for enrolling bulls for the first test was March 1, 1970 and they will be admitted to the station on May 11 and 12. Bulls may be enrolled for the fall test up to September 1 and will be admitted to the station on November 3 and 4.

The animals must be between 160 and 250 days old on arrival at the station, that is to say born between September 1 and November 28, 1969 for the spring test and between March 1 and May 28, 1970 for the fall test.

Any breeder of purebred beef cattle in Quebec can submit bulls for testing. They must be identified by tattoo marks and owners must produce registration papers and a certificate stating that the animals come from a herd free from brucellosis, tuberculosis and other contagious diseases. The certificate must have been signed by the veterinarian of the district from which the animals come, within 30 days before their arrival at the station. Charolais bulls must have at least $\frac{7}{8}$ Charolais blood.

Applications for enrolment must be accompanied by a fee of \$10 per head. Maintenance charges are \$75 per head. A grant of 10 cents will be allowed for each mile travelled in bringing and taking away the animal, with a limit of \$50. The amount of the grant will be deducted from the maintenance charges payable at the end of the test.

Bulls will be given 28 days to adjust to their new environment before the start of the 140-day trial period. The test begins with weighings on two consecutive days, the average being taken as the starting weight. Subsequent weigh-



ings take place fortnightly till the end of the test. The amount of meal fed is carefully regulated, each animal's ration being calculated on the basis of the two initial weighings and recalculated after each fortnightly weighing.

At the end of the test, the owner receives a report on the results, showing the daily gain of each animal during the test period, his one-year weight and feed conversion rate, percentage index of gain, and rating in comparison with the other bulls of his breed.

Two New Advisory Sub-Committees

The Minister of Agriculture and Colonization, Mr. Clément Vincent, announces the formation of two new study sub-committees to the consulting committee of the Quebec Agricultural Marketing Board.

The new sub-committees will be concerned with maple products and apples. Their formation brings to six the number of such bodies set up during the past 12 months. The other four are concerned with manufacturing milk, fluid milk, market-garden crops, and hog production.

These sub-committees are composed of agricultural experts and a representative of the Department of Agriculture and Colonization's marketing division who acts as secretary and moderator at meetings. They are presided over by a member of the Marketing Board's consulting committee. Their task is to study in detail problems connected with the production and marketing of Quebec's main farm products and to make recommendations to the Marketing Board to guide it in its decisions.

If the Board considers it advisable, such recommendations are referred to the agricultural department, which then takes the necessary steps to remedy the unsatisfactory situation or implement measures designed to revitalize the sector concerned.

Reorganization on Provincial Scale

A group of apple growers (most of them owners of large orchards in southern and southeastern Quebec) voted by 118 to two (with five abstentions) in favour of reorganization on a province-wide scale, during a recent meeting in the St-Hyacinthe Institute of Agricultural Technology.

They also decided to leave the necessary steps to a seven-man sub-committee created recently by the Minister of Agriculture and Colonization, Mr. Clément Vincent, and affiliated with the Quebec Agricultural Marketing Board. The sub-committee is composed of Mr. Edouard Duchesne of Mont St-Grégoire, chairman; Marcel Gagnon of Frelighsburg, William Beattie of Hemmingford, Alain Chabot of Rougemont, Ernest L'Espérance of Fresnières de St-Eustache, René Trépanier of Oka, members; and Gilles Lasnier, marketing adviser at the Department of Agriculture, secretary.

To ensure representativeness in keeping with desires expressed at the meeting, the apple growers chose 16 promoters (one for each of the main apple-growing parishes). These will enlist helpers and work with them to decide the best system of organization, after consultation with other apple growers, and experts on the sub-committee.

The meeting was the outcome of a decision reached at "Apple Day" held in St-Hyacinthe on December 11 for growers in the St-Hyacinthe and southwest regions of Montreal. Quite a number of the growers present expressed some reservations about the idea of an accredited organization under the existing acts. However, a clear majority were in favour of forming a representative organization under the professional syndicates act, although several also felt that amendments should be made to it. Some of those present considered that an ideal name for the organization would be "l'Association des Pomiculteurs du Québec".

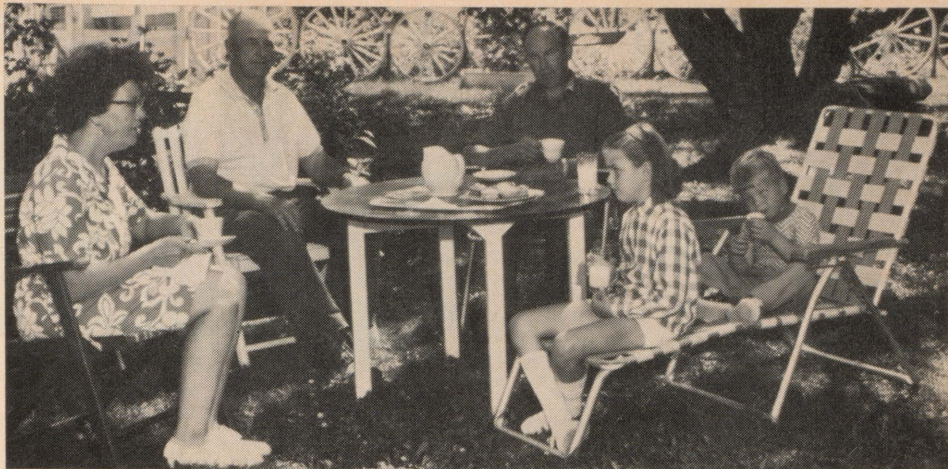
Names of the promoters and the parishes they represent, as chosen at the meeting, are as follows: Luc Lasnier, Ste-Cécile de Milton; Guy Laffitte, St-Rémi; Jules Béchette, Rougemont; Jules Boucher, Mont St-Hilaire; Jean-Paul Lasnier, Ste-Brigide; Denis Roy, Dunham; Richard Côté, Farnham; Claude Lussier, St-Antoine-Abbé; Arsène Poisson, Rougemont; Guy Husereau, Oka; Gilles Robert, St-Pie de Bagot; Raymond Gamache, l'Islet; Allan Thomson, St-Paul; Florian Barré, L'Ange-Gardien; Gilles Tessier, Frelighsburg and Norval Blair, Franklin.

Production of Mink Pelts in 1969

Quebec mink raisers had a fairly good year in 1969 with an output reckoned at about 175,000 pelts or roughly 5 percent more than in 1968. In issuing this estimate, Mr. Stephen Poliquin, head of the fur animals section of the Quebec Department of Agriculture and Colonization's Artificial Insemination

Beef cattle on the farm of Mr. J. M. Tremblay at Grande-Baie, Chicoutimi.

Mr. and Mrs. Adair Annett with Robert and Lois and Mr. Gordon Annett.



and Livestock Improvement division, said that approximately 80 percent of Canada's mink production, estimated at 1,300,000 pelts, had been bought by the international mink fur trade at auction sales, mostly in Montreal, during the past December and January. In spite of the large number of skins (200,000 to 300,000) offered at each auction, the demand was generally steady.

Prices ranged from \$20 to \$54 for black pelts and from \$18 to \$24 for pastel brown. These prices are about 10 percent lower than those offered for the better quality pelts last year. Mr. Poliquin thinks the fall in prices can be attributed to current high interest rates causing fur dealers to limit buying to immediate requirements, instead of for several months ahead as in other years.

European buyers were very active this year thanks to a brisker economy, according to the experts. Dealers from West Germany, Italy and Switzerland were particularly keen and have attended nearly all auctions held so far in Canada and other producing countries like the United States, Great Britain, Norway, Denmark and Sweden.

Skins of the "Majestic" category — the quality rating adopted by the Canada Mink Breeders' Association — were more in demand than those of what is termed commer-

cial quality, which are generally used for trimmings. Pelts 30 inches or more in length remained the favourites provided they satisfied requirements as regards colour, texture and density of the fur.

Buyers continued to show a preference for standard dark, jet black, and dark brown pelts. Light shades like sapphire, pearl, and violet were in less although steady demand.

A Progressive Family Farm

As you approach Mr. Adair Annett's farm at Saint-Octave, you get the impression that you are coming to the home of a progressive farmer and also to the home of people who know how to live. The black-roofed buildings make an attractive sight in their setting of lawn, trees, shrubs and flowers. The house, which is reached by an entrance separate from the farm road, is decorated with roses.

Mr. Adair Annett, who is 48, took charge of this farm of 500 arpents — 220 under the plough — in 1958. His father, Gordon Annett, still hale and hearty at 76, lives there as well and is able to help occasionally.

Last year they sowed five arpents of Garnet wheat, 10 arpents of Champlain barley and 55 of Garry oats. A considerable part of the oats was used for emergency pasture. The grains that are to be harvested are always grown from certified seed and are protected against weeds, especially mustard, by selective herbicide sprays. The forage crops consisted of 30 percent Vernal alfalfa, 20 percent

Ottawa red clover, 30 percent Saratoga brome grass and 20 percent Climax timothy, with Ladino clover and orchard-grass added in the case of the rotated pastures.

Ten of the 42 cows in the Holstein herd are registered. The herd produced 460,000 pounds of milk in 1968. There are also about 20 young Holsteins of fine conformation, and two purebred bulls. A Matane dairy buys the milk at a quota of 1,174 pounds a day.

Investment in machinery and equipment is reckoned at \$30,000. This includes three tractors, implements, a self-propelled windrower, a combine, barn cleaner, ventilators, a fresh air hay-drying system, a 4,000-pound bulk milk tank, milking machines and complete pipeline system.

The big frame house, completely finished inside with Columbia pine, was built by father and son with their own hands. Mrs. Annett, the mother of two charming children — Lois, aged eight and Robert, aged three — is a very good housekeeper and takes devoted care of the antique furniture she collects.

QWI

Argenteuil

Brownsburg: Sent a gift to a forgotten patient at the Douglas Hospital, Verdun. Pioneer: Members greatly enjoyed a Valentine Party. Jerusalem-Bethany: Highlight of the February meeting was the showing of slides of local autumn scenes, with commentary by Mrs. A. Morrison. Lachute: The report of the branch's first annual meeting was read. This meeting had been held on March 7, 1933.

Baldwin-Cartier

West Island: Mrs. Susan Armitage, Dietitian, Lachine General Hospital, gave an interesting and informative talk on how to serve nutritious meals. The talk was followed by a question and answer period. The roll call was a favourite quick recipe.

Bonaventure

Black Cape: Reports on a letter received from foster child. Marcil: Had two members attend classes for business French. Port Daniel: Mrs. P. Jones, the President, was presented with a copy of the book entitled "Heritage of Canadian Handicraft".

Chateauguay-Huntingdon

Franklin Centre: After discussing Bill 62, asked the question, "What can we do as a group and as individual members?" Hemmingford: The Principal of Hemmingford Elementary School, Mr. R. McKay, spoke on the continuous progress system of learning now being implemented in the local school, giving its advantages over the graded system. Also heard the comments of the Q.W.I. Convener of

Education on "What to do as W.I. Members". Sewing courses for beginners and advanced are proceeding well, with good progress and much enthusiasm. Huntingdon: Heard an interesting article on rabies. One of the members had prepared a particularly interesting and vivid account of the early days of Huntingdon. This was much enjoyed by all. Ormstown: Miss Nan Gilsthorpe of Ormstown, author of "Doctor Leslie's Triumph", was the guest speaker.

Compton

Bury: A guest speaker was Diana Parker from Radio Station C.K.T.S. Sherbrooke, who spoke on her work there as traffic manager, copy writer, and women's commentator. An interesting article on a picnic held in Bury when the section of the railroad was completed here and Sir John A. Macdonald was a guest of honour was enjoyed by all. The history of the Bury W.I. is completed and each member received a copy. Mrs. A. Olson was presented with a Life Membership.

Gatineau

Eardley: Miss Mildred Robinson of Ottawa showed slides of the National Art Centre and of her trip to Gaspe, Nova Scotia, and Prince Edward Island. Rupert: Mrs. Joe Nesbitt gave a history of the Rupert Women's Institute. This branch is 44 years old and still has four Charter Members. Wright: Mrs. Emile Lachapelle had readings entitled "Chronic Arthritic Pains" and "Rheumatoid Pains". She also gave valuable health hints.

Missisquoi

Cowansville: The Convener for Home Economics told of a frozen food company that dated their products and stated the length of time that they could be kept safely. Heard an article on "The amount of cyclamates in soft drinks". Saw slides of the South Pacific Islands. A member read a poem "When Mother Made Her Soap", written by a former local poetess. Stanbridge East: The Convener of Home Economics displayed several types of casters and read an article on "Safety casters for protection of vinyl flooring and nylon carpeting".

Pontiac

Clarendon: Mrs. M. McCord was guest speaker telling of her recent trip to Britain. Fort Coulonge: The Convener of Citizenship read an interesting paper on "The Maple Leaf Forever", by the author and composer of words and music, Alexander Muir, a Scot who was only three years old when he came to Canada many years ago. Quyon: Mrs. Lowenberger, of the staff of the Pontiac High School, spoke on retardation and learning disabilities. The earlier these problems are discovered and faced the better for the child.

Richmond

Denison Mills: The magazine Canadian High News was given to the members at this meeting. Gore: A gift was sent to a member's husband who had been in hospital. Home Economics Convener read articles on "Misleading Prices" and "Packaging of Several Articles". Richmond Young Women: Heard articles on "What is Ahead in Education", and "What is a Canadian?"

Rouville

Abbotsford: Talk given by a member who had attended N.Y. Horticultural Society. Literature and recipes also available. C.A.C. helpful hints heard.

Shefford

Granby West: Members have started a Pen-Friendship with branches in England and Scotland. Granby Hill: Held a quilting bee and sold that quilt. They are making another.

Sherbrooke

Lennoxville: Dr. Kathleen Otto read a very informative article concerning the care of house plants.

Stanstead

Ayer's Cliff: Sent a plant to a sick member and a shower of cards to a member in hospital. Hatley Centre: Helped a local family who recently lost their belongings by fire. Stanstead North sent valentines to Dixville Home.

Projects for the Month

Bonaventure

Black Cape: Catered to the Knights of Columbus Ball. Marcil: Members sold tickets for a turkey raffle to aid Agricultural Society. Served lunches to adult class at S.P.D.S. and soup at lunch hour to approximately 175 pupils in local school. Matapedia: Held a home cooking sale. Capsules and hot soup provided for the school pupils. New Richmond West: Held a bake and handicraft sale. Remembered sick and shut-ins. Port Daniel: Collected \$66.70 for UNICEF and Pennies for Friendship.

Brome

Austin: Request for magazines to be made into fireplace logs for sale. Austin Boys Club to be sponsored. A box of wool swatches was donated to be made into afghans for senior citizens. South Bolton: Quilt top donated to be made up later.

Chateauguay-Huntingdon

Franklin Centre: Made a crib quilt to be raffled at a valentine party. Arranging for a public speaking contest.

Gaspé

Dartmouth: Amateur hour held. Proceeds bought a reclining chair for the husband of one of the members who suffered a broken neck in a fall. Douglastown: Tickets were sold on a pair of pillow cases — proceeds for branch funds.

Gatineau

Rupert: Reports sewing and knitting done for Save the Children Fund.

Compton

Bury: Two hand woven rugs donated by Mrs. Gordon were raffled. Sawyerville: Held a Ham and Bean supper in aid of the school cafeteria. Sponsored a teen age girl at Winter Carnival.

Megantic

Kinnears Mills: Sold cookies to aid Pennies for Friendship. Will serve lunch for Valentine Dance. Inverness: Plan to make a quilt. Saw material to be made into shopping bags, cushions, etc., and then sold.

Missisquoi

Dunham: Members making an afghan. Fordyce: A quilt tied and given to the Red Cross. Clothing brought in for the Cecil Butters Home.

Donations Made by Branches

Austin: Nineteen pounds of cotton sent to Cancer Clinic and \$100 donated to prospective Senior Citizens Home in Magog.

Bristol: Donated \$10 to cup of milk fund.

Aubrey-Riverfield: Sent a box of goodies to the Preston Home and valentines to the Children's Home.

Clarendon: Donated 34 bibs to Ade Hospital. Serviettes, candy, and children's toys given to the Pontiac Community Hospital.

Dunham: Made a donation to the cancer fund in memory of Mr. Amos Laduke and \$5 was donated to Retarded Children Occupational Services.

East Angus: Donations sent to the Northern Canada Women's Institute and the Quebec Service Fund.

Knowlton's Landing: Donated to Service Fund and to Pennies for Friendship.

Lennoxville: Forwarded \$20 to Lennoxville Elementary School for Hot Lunch Fund.

Milby: Gave a bushel of apples to Dixville Home and six large cans of juice to Winder Acers Home, Lennoxville.

Murdochville: Gave \$10 to school for books, also money to pay for postage on parcel to be sent to Mr. Howard Henderson for the Indians.

New Richmond West: Gave \$10 to New Richmond High School for year book.

Restigouche: Donation sent to Hot Lunch Fund at Matapedia Intermediate School.

Rupert: Donated \$5 to the cup of milk fund.

Sutton: Donated gifts to Home and School Club for cheer boxes. Money given for hot lunches for needy children.

Starks Corners: Donated to cup of milk fund and to needy children in local school.

Quyon: Donated to cup of milk fund.

Wright: Sent \$10 to the Quebec Service Fund.

Branches having Demonstrations

Aubrey-Riverfield: Made OREO-OH-Ray dessert which was later enjoyed at lunch. The practical uses of contact paper in covering kitchen articles and in the construction of a wishing-well planter were also demonstrated.

Bury: Showed how to make wrapping paper by melting wax crayon shavings on white paper. Members also saw the art of making quilts using nylons for batting.

Dalesville-Louisa: Made plans for a jewellery demonstration.

Frontier: Had a cake icing demonstration by a talented member.

Bills 62 and 63

East Angus, Granby West, and Abbotsford sent letters to the Premier of Quebec protesting Bill 62. Branches which discussed Bills 62 and 63 were: Stanbridge East, Dundee, Franklin Centre, Huntingdon, and Belvedere.

A Letter from Rawdon, Montcalm County

After a short business meeting, a fascinating "tour" of Europe was enjoyed with the showing of coloured slides by Mrs. Harris, the daughter of our Mrs. Hanson. They had made a three-week trip to

Europe together last fall. Mrs. Harris was a most interesting and lucid narrator, with a remarkable memory for the many points of historical interest which they saw. It was extremely gracious of her to drive to Rawdon after office hours on a very cold night and have to leave at seven o'clock the

following morning. Regrettably the attendance was rather small — and those who were unable to attend missed a delightful experience.

Some Interesting Roll Calls

Granby Hill: A recipe from a new Canadian. Ayer's Cliff: Bring a get well card for the Sunshine Convener. Rouville: A personal highlight. Cowansville: A sentence said in French. Aubrey-Riverfield: Exhibit a labour-saving kitchen device. Hemmingford: Name an author and a book he or she wrote. Inverness: Spell your name backwards and give the date of your birth in French. Spooner Pond: Suggest a suitable gift for a hospital patient.

Q.W.I. News

The semi-annual board meeting, held at the Y.W.C.A., Montreal, on February 13-14, 1970, was very well represented notwithstanding the severe weather, and only the most northerly and the most easterly counties found it difficult to attend.

Altogether, it was a very successful session and a great deal of business was accomplished. As each branch will receive a copy of the minutes covering all transactions, a detailed report at this time is unnecessary.

Good News! You will all be glad to know that Mrs. Ossington is now on the road to recovery, and sends her thanks and appreciation for all the cheery cards and get-well wishes extended to her by the members of the Q.W.I.

The Last Word

I think in all fairness that "instant experts" cannot include either the farmer or John Q public. The "instant experts", therefore, must be the vociferous scientist-conservationists who are activists in trying to get better control of pesticides. They could also be called the "pesticide doves".

The spirit of conservation budded over a hundred years ago even before such great naturalists as Wallace and Darwin were able to give cohesion to the science of biology. The spirit was captured in the book "Walden" written by Henri David Thoreau in 1854.

Great things happened in the ensuing years which finally culminated in the depression of the thirties. The development of trains, cars, planes, telephones and radios in this period made it a great era of communications. Back on the farm first generation pesticides, kerosene to coat ponds, arsenate of lead for chewing insects and nicotine for sucking insects, were products commonly found in homes. No one really worried about them because their use was restricted to the needs of the crops, which were not very extensive. The more important agricultural stories of that period were the droughts, the dust bowl due to poor agricultural practices and finally, the abandonment of land whose last ounce of fertility had been withdrawn by poor farmers in a vain attempt to preserve their title to ownership. In retrospect of a rapidly deteriorating environment, Aldo Leopold wrote a though provoking article for the "Journal of Forestry", (Vol. 31), in 1933. The title of the paper was "The Conservation Ethic". In this paper and in others such as, "A Sand County Almanac", 1949, Leopold wove ethics, science and political action into a fabric which would eventually capture the imagination of future wildlife biologists and ecologists and let them, in turn, lead other kinds of biologists out of their ivory towers into the public arena of debate.

By the time "A Sand County Almanac" was written, we were into what is called the age of the second generation pesticides of which DDT was the first. Carroll Williams ("Third Generation Pesticides", Scientific American, July, 1967) in reviewing the early years

of DDT said "A few wise men warned that we were living in a fool's paradise and that insects would soon become resistant to DDT, just as the bacteria had managed to develop a resistance to the challenge of sulfanilamide. That is just what happened. Within a few years mosquitoes, lice, houseflies and other noxious insects were taking DDT in their stride. Soon they were metabolizing it, then they became addicted to it and were therefore in a position to try harder".

The chemical companies were quick to realize that killing insects was big business and a race to produce and sell new products was on. By 1966 sales of pesticides in the U.S. had reached the \$500 million mark.

By the late 50s concerned and knowledgeable wildlife people felt that evidence for the indictment of the second generation pesticides was adequate and the first positive step was taken. Rachel Carson was encouraged to write what Lamont Cole ("Scientific American", December, 1962) called an "Indictment of the wide use of Pesticides". The Leopold fabric was packaged with skill; the tactics so often used by Madison Avenue advertising agencies almost burst from the pages of "Silent Spring". As Lamont Cole pointed out, "the book contained a highly partisan selection of examples and interpretations that support the author's thesis. The fact remains that the extreme opposite has been impressed on the public by skilled professional moulders of public opinion".

To her credit Miss Carson cited her list of sources so that the reader could judge the evidence on which she based her statements. Her critics never cited evidence and yet they described "Silent Spring" in terms of "an emotional and inaccurate outburst".

As an ecologist who is concerned about the future of our environment and one who enjoys trying to understand the strategies of getting things done, I think the entire episode was beautiful. Miss Carson appealed to the nature lovers,

In the February issue of the Journal, Walker Riley (The Last Word) presented what I feel is a very biased view of the pesticide and pollution problem to arrive at a status-quo conclusion. His concluding statement was, "Let us not throw away irreplaceable tools, but let us learn to use them with caution and with skill, so we all can eat and live better". My interpretation of this sentence is, "Let's carry on using all and sundry pesticides but read the labels and follow directions so we all can eat and live better". Let's for a moment look at some historical and present day facts before judging whether or not the above conclusions are simply pious hopes by pesticide users who have been "taken" in the great American tradition.

Mr. Riley like most "pesticide hawks" often uses the term "instant experts" without saying who or what they are. The first time I heard the expression "instant experts", referring to people who were concerned about the use of pesticides, I heard it from a MacDonald graduate who works for Niagara Chemicals. The beauty of this term is that there is no distinction made between people who are simply very concerned without really knowing why (the people who make the democratic process work) and those who have been working on environmental problems for a much longer time than the chemical companies have been working on the fabrication and sales of pesticides. Just as the farmer might worry about what would happen if he did not have pesticides, there is a larger group of people who are concerned about the continued use of pesticides.

the bird watchers and the sportsmen, and, above all, she subtly played the heart strings so that one felt that to allow the continued use of pesticides would be equal to being against motherhood. She did not use technical jargon nor did she go into the ramifications which might have bored the reader. She used prosaic terms such as the "balance of nature" and "killing of weaklings" to oversimplify ecological and evolutionary concepts.

The total package had the right effect in that it awakened people, if not to a fact, at least to an impending abuse, the instigators of which were thought to be the pesticide companies seeking increased markets.

In an article called "Pests Follow the Chemicals in the Cocoa of Malaysia", ("Natural History", February 1969), Gordon Conway of the Agricultural Research Center, Sabah, Malaysia, describes the historical events which led to the widespread use of pesticides on cocoa and the eventual withdrawal of these same products. The withdrawal was a successful program to re-establish some semblance of stability of pest populations at low levels. Conway prefaced his cocoa example with a dispassionate statement concerning the increased usage of pesticides, examples of their effectiveness and the danger to the environment. "After the Second World War the new synthetic insecticides DDT, BHC, dieldrin, endrin, Malathion and others became universally available. Their use in Malaysia grew slowly at first but has accelerated in the last 10 years with the establishment of several vigorous concerns specializing in the sale of agricultural chemicals. The benefits these pesticides have brought have been considerable. BHC, DDT and dieldrin have been particularly effective against rice pests; in Sabah, dieldrin has provided a cheap and extremely effective means of combating the locust outbreaks that had previously been so serious, and DDT and dieldrin have been the main instruments of the successful malaria-control program. However, my experiences, and those of other entomologists in Malaysia, suggest that the increasing reliance on these pesticides has not been

wholly beneficial. Used without regard to the ecological factors of the situation, they may aggravate existing pest problems or create new ones and they can produce unwanted and far-reaching side effects".

The cocoa example from the tropics is particularly good because changes in the size of populations within a community occur fast enough so that one can relate cause and effect. Similar indirect effects of pesticides in our mid-latitudes would be slower to occur and harder to detect. If this sounds like a disclaimer, you are right — it is. The tools with which field ecologists can measure subtle changes in the environment are still very primitive. Virtually all that ecologists were able to do with all their financial and human resources was to discover how the use of DDT is seriously threatening the existence of a few species of birds. This evidence led a small number of agencies to ban the use of one pesticide, DDT — a chemical whose sales amounted to 1 percent of the total value of pesticides sold in Canada last year.

As an ecologist, I am worried because our research capability points to a damned poor record and what is worse, we, who are concerned, are losing ground. In 1968-69 National Research Council made two grants totalling \$11,070 to University Scientists to study the effects of pesticides on wildlife. "Annual Report on University Research, 1968-69", NRC of Canada 1969. In the period 1966-1968 the Canadian Wildlife Service's pesticide operating budget increased 300 percent to a mere \$192,000. That is the entire budget spent by Canada on studying the effect of pesticides which include insecticides, herbicides and fungicides. As Tony Keith points out in an editorial entitled "The DDT Affair" (Canadian Field Naturalist, Vol. 83, 1969) "this research (all research not only Canada's) is merely a sop to the conscience of the scientific community, a pretense with no real function in resource management."

I think the significance of the pesticide corporate attitude toward "instant experts" is quite plain.

They feel threatened and so they should. More and more the public is developing a philosophy that corporations have the primary responsibility of not polluting our environment and that the cost of mitigation should be borne by companies. For example, no one has suggested that the taxpayers should pay for cleaning up oil spillage from the Arrow. I think that all new legislation against pollution from industrial waste and pesticides, both in the U.S. and Canada, should be particularly frightening to the pesticide industry. The pesticide industry is undoubtedly aware that the poor record of the scientists working on DDT points to the fact that pesticide monitoring and studies of direct and indirect effects of ecosystems are going to be an exceedingly costly business. Realize that research would be far more complicated simply because it involves more variables and more species than that carried on by our food and drug agencies. Pesticide companies now grumble about the time it takes to clear their products so you can imagine how they fear the day that our government starts pulling pesticides off shelves for further testing as they did cyclamates.

Can we survive with so-called panic legislation which would drastically reduce the use of pesticides? I'm confident I would but I doubt if the pesticide companies would. I have never yet heard a sober, thoughtful ecologist say destroy all pesticides. In fact, a good many ecologists would like to see integrated control systems developed for crops as suggested by Vernon Stern et al in 1959 ("Hilgardia", Vol. 29, No. 2).

It is a virtually useless pesticide but what about the rest of the chlorinated hydrocarbons which are similar to DDT and the newer shorter-lived organo phosphates. It will be a sad epitaph if we have to admit that one of these wonder products ruined our environment because we didn't have time to test it adequately, or that no one would pay to test the product adequately, or that we did not have the political organization which would assure that the product was adequately tested.

I can only feel delighted over, as Mr. Riley puts it, "The furor over pesticide pollution that has been stirred up by instant experts." I heartily agree with Mr. Riley that "panic, as we know, arises out of fear of the unknown".

A second approach which would ease the minds of many ecologists would be controlled outlets for pesticides. Obviously these two suggestions are not popular in industrial circles because the integrated control systems use far less and fewer pesticides and controlled outlets would particularly hurt the household pesticide business which is spectacularly large.

I fear and distrust pesticide pushers when I read on my Garden Guard Rotenone insecticide container that "it leaves no poisonous residue on plants" but yet reads "Caution — keep out of reach of children" . . . "The buyer assumes any risk to persons or property arising out of use or handling and accepts the product on these conditions". There is no mention of how much should be used; only what it can be used on. The question is, "Is it harmful or not and to whom?" Rotenone incidentally is commonly used to poison fish in lakes at concentrations of 2-10 parts per million.

I fear and distrust pesticide pushers when I read on my Para Bomb-m Junior, "an insecticide for fleas, lice and ticks on dogs and cats, a deodorant against dog odour and repellent for flies, mosquitoes and gnats". The caution reads "Keep out of reach of children; do not puncture or incinerate container; avoid breathing of spray mist; avoid repeated contact with skin, etc." The clincher is a notice on the side of the container which reads "sold to veterinarians only", not through veterinarians only. Incidentally I am not a veterinarian. This product has five active ingredients including Malathion.

I fear and distrust pesticide pushers when I read the directions on my unopened can of household Ant and Grub Killer (five percent chlordane dust). The fine print says one pound treats 300 to 500 square feet. I wonder how many people have figured out how much, or even how to figure out how much, should be put on the row of onions in the garden. We keep hearing that we should not panic just because pesticides might kill wildlife and that there is no evidence that pesticides are injurious to humans. My little can, however, has a curious caution for a harmless product. It reads, "Do not breath dust. Harmful if swallowed. May be absorbed through skin. Do not apply to edible crops within one month of harvest. Use with caution on young cucumbers and melons. Remove from skin by washing with soap and water. Keep out of reach of children".

Incidentally none of my three labels say what to do with the container when empty. My para bomb does say "Do not puncture or incinerate container. Do not expose to temperatures above 120°F, such as windows, or stoves or radiators, etc."

In the light of evidence found on household pesticide containers to even suggest that the public can learn to use them with caution and skill is a pious and impractical hope.

To state that pesticides are "irreplaceable tools" must be said with a good deal of elaboration. The work carried out in Malaysia, like the work on integrated control systems, both suggest that pesticides could be far more effectively used in smaller quantities and at irregular intervals when needed.

The fact that it took 20 years to get enough irrefutable evidence to mount a campaign which eventually outwitted the pesticide industry and caused us to be "stampeded by our instant experts into passing panic legislation", scares me. DDT is a dead issue.

Yes, if I were a pesticide company, I would fear restrictive legislation in the use of pesticides. Yes, if I were a pesticide company, I would fear that integrated control systems might just catch on in agriculture. Yes, if I were a pesticide company, I would fear the thought of controlled outlets for pesticides. Yes, if I were a pesticide company, I would fear legislation that would force any pesticide user to clean up the mess as oil companies do when they have an accident. Yes, if I were a pesticide company, I would fear ecologists and wildlife biologists who even with minute funds have been finding that the use of pesticides can have all sorts of side effects — in fact, even "aggravate pest problems or create new ones". Yes, if I were a pesticide company, I would fear those conservationists who adapted the fabric so skilfully woven by Leopold to fight me, using my own tactics and weapons.

There is an old saying which states that there is a sucker born every minute and I have come to the conclusion that we, the pesticide users, have been "taken". Like the physicists who at first praised the development of atomic power for what it was but then later were equally vociferous in agitating "ban the bomb", I, too, want to get off the merry-go-round.

"The ultimate issue, in conservation as in other social problems, is whether the mass-mind **wants to** extend its powers of comprehending the world in which it lives, or, granted the desire, **has the capacity to do so.**" A. Leopold, "A Conservation Ethic," 1933.

Dr. J. R. Bider,
Department of Woodlot
Management.

Subscribe TODAY to the all new MACDONALD JOURNAL

Only \$7
for 2 years,
\$9 for 3 years,
\$10 for
2 years outside
Canada.

MACDONALD JOURNAL,
451 Beaconsfield Blvd.,
Beaconsfield 870, P. Q.

Please enter my subscription for
years at a cost of

Name

Address



NATURAFLOW —
MAPLE SAP TUBING FROM
TREE TO VAT WITHOUT
HANDLING

FLOMOR —
MAPLE TAP HOLE PELLETS
INSURING A LARGER FULL
SEASON'S FLOW.
\$6.50 for 500 pellets.
FREE LITERATURE

**NATURAFLOW MAPLE SAP
PLASTIC TUBES & SUPPLIES LTD.,**
St. Emile de Montcalm, P. Q.

"CHEZ PERRON TOUT EST BON"

THE BEST IN

SEEDS • PLANTS • GARDEN SUPPLIES

"WE LEAD IN PLANTS & SEEDS"

1970 GARDEN BOOK, PRICE 50¢ — AMOUNT DEDUCTED
FROM ORDERS OF \$3.00 OR MORE

W. H. PERRON & CO. LTD.

SEEDSMEN & NURSERY MEN

515 Labelle Blvd., Chomedey 332-3610 Ville de Laval, P.Q.

AMPROL*
SOLUTION 9.6%
(amprolium)

Now there is a way to treat out-
breaks of cecal coccidiosis in
your laying flocks without inter-
fering with egg sales. Amprol
Solution, used according to in-
structions can quickly bring the
infection under control — Ask
your animal health products dis-
tributor for more information on
AMPROL SOLUTION, for laying
birds and growing chickens too.

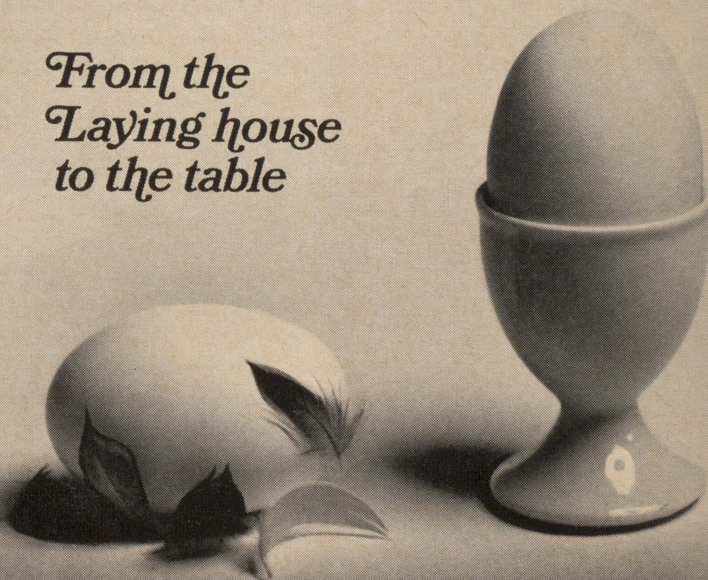
FULL INFORMATION AVAILABLE
ON REQUEST.



**MERCK
SHARP
& DOHME** CANADA LIMITED
CHEMICAL PRODUCTS SALES

*Reg. Trade Mark

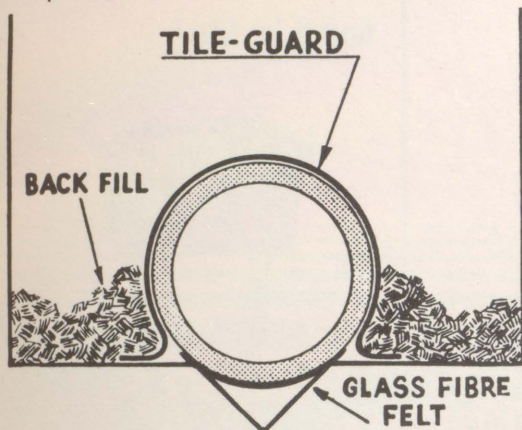
*From the
Laying house
to the table*



NOW... Prevent FARM DRAINAGE TILE CLOGGING

With "Tile Guard" and "Glass Fibre Felt"

"Tile Guard" Drainage Tile Cover is a web-like mat composed of inert glass fibres made of materials specifically compounded to withstand underground alkalis and acids. It is virtually ageless, and effectively retards the passage of soil particles into the tile.



Permits use of smaller tile.
Why use 6" when 4" will
do with Tile Guard and

GLASS FIBRE FELT
For Under Support
and Protection
in Unstable
Soils

MR. FARMER: Discuss your problem with The County Agricultural Representative or Extension Specialist. For complete information at no obligation write or telephone collect to:

**GLOBE GLASS SATURATORS
LIMITED**

Manufacturers of Glass Fibre Roofing Products and Tile Guard
P.O. BOX 190 PETROLIA, ONTARIO DIAL 882-2300
or Request Material from Your Drainage Contractor



PURE CANE

MOLASSES

provides palatability, improved rumen activity, conditioning and tonic effects. Feeding pure cane molasses builds nutrition.

18

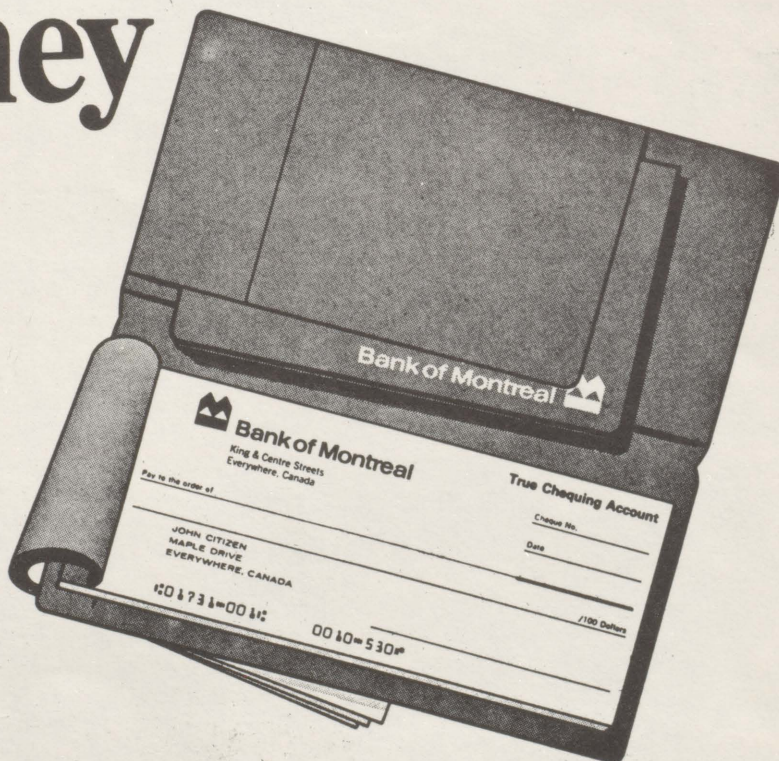
**CANADA WEST INDIES
MOLASSES
COMPANY LIMITED**
MONTREAL - TORONTO

the money planner

A True Savings Account, paying an attractive interest rate, helps you plan your way to the things you want — gives you a firm grip on what you have.

A low-cost True Chequing Account provides monthly account statements and free personalized cheques.

Get your money planner wallet at



Bank of Montreal

Canada's First Bank

More silo for your money!

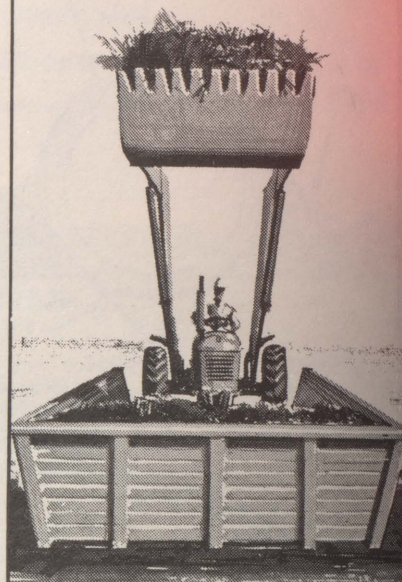
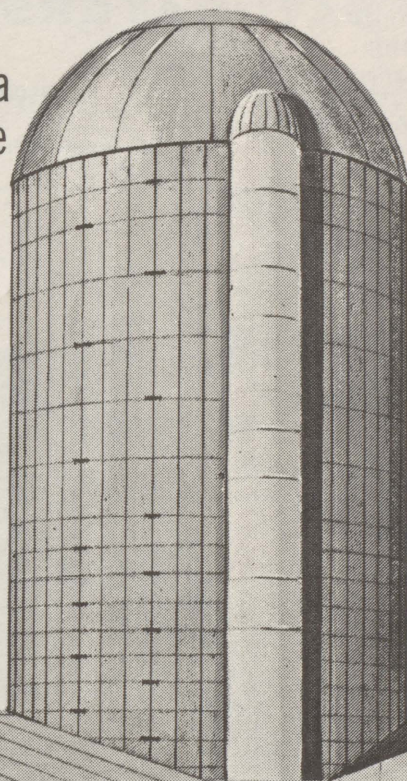
THERE'S A CCC DOMTAR SILO
PROFIT-FITTED TO YOUR FEEDING SYSTEM

CCC Engineered upright silo: a
"tower of strength" to increase
profits automatically!

Streamline and reduce feeding costs with a tower silo engineered for the western climate! Feature for feature, foot for foot, this is the outstanding tower-silo value - built for permanence with CCC pressure-treated lumber to resist silo-acid attack and winter freezing.

Tongue-in-groove radially-milled staves prevent feed spoilage due to air penetration. The CCC Domtar tower silo is also designed to give you maximum efficiency from automated loading and unloading equipment. Its performance and convenience features include extra-large filling door . . . roomy heavy-duty chute . . . sturdy safety ladder and platform . . . post-and-beam foundations that resist frost heaving.

In every way, it fits your feeding operation profitably!



Low cost-per-ton storage combined with the year-in, year-out permanence of CCC pressure treated posts and lumber! Wagons, tractors or trucks can drive right in - or use with newly-developed, manpower-reducing equipment.

Your CCC lumber dealer has plans for 16 ft. x 16 ft. silo, with sturdy tongue-in-groove plank walls - readily adaptable to any length or width. Call or see him soon!

Ask your CCC dealer for profit-making silo facts, or write direct to:

CCC DOMTAR Chemicals Limited
Wood Preserving Division
395 de Maisonneuve W., P.O. Box 7212
Montreal 101, P.Q., 514/5571

